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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/532,275	03/21/2000	Masaki Ukai	826.1595/JDH	7491

21171 7590 06/16/2004

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EXAMINER
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KIM, KENNETH S

ART UNIT	PAPER NUMBER
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2111

DATE MAILED: 06/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/532,275	<b>Applicant(s)</b> UKAI, MASAKI	
	<b>Examiner</b> Kenneth S KIM	<b>Art Unit</b> 2111	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

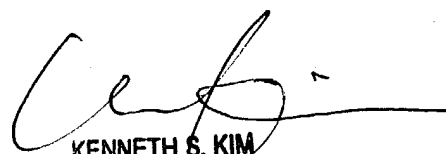
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 April 2004.
- 2a) ☐ This action is **FINAL**.      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 49-94 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 62, 64, 85 and 87 is/are allowed.
- 6) ☒ Claim(s) 49-61, 63, 65-84, 86, and 88-94 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

  
KENNETH S. KIM  
PRIMARY EXAMINER

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

1. Claims 49-94 remain for examination.
2. Applicant is reminded that the office action mailed January 15, 2003 was vacated, since it was mailed prior to the entry of the preliminary amendment.
3. It is noted that the newly presented set of claims closely replicates the claims (of the elected group) in the amendment filed June 12, 2003 (which was in response to the vacated office action and was not entered; the non-entry caused confusion) and is accepted as the current set of claims.
4. Applicant is request to supply a copy of PTO Form-1449 for the IDS filed March 21, 2000 (it is missing, if it was previously filed).
5. The abstract of the disclosure is objected to because the current abstract does not reflect the inventive feature of the claimed invention. Correction is required. See MPEP § 608.01(b).

All amended abstracts are to be submitted on a **separate sheet** (without the brackets and underlines) in addition to a mark-up copy.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 49-61, 63, 65-84, 86, 88-94 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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- (a) Claim 49, it is not clear how the "not occur simultaneously" is achieved (based on the other limitations in the claim).
- (b) Claim 49, it is not clear what is the significance of "writing of branch information" and "fetching of instruction string" not occurring simultaneously, for their relative impact over the other is not clear from the other limitations in the claim.
- (c) Claim 49, it is not clear what (which instruction) is fetched by the fetch request. It is noted that a fetch request always precedes any other activity, for instructions are fetched before being processed.
- (d) Claim 56, it is not clear what is the relevance of the counter counting several clock cycles with respect to the rest of the claim limitations.
- (e) Claim 73, the same as (a) to (c).

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 49-55, 57-61, 63, 65-72, 73-84, 86, and 88-94 are rejected under 35

U.S.C. 102(b) as being anticipated by Tran et al, U.S. Patent No. 5,875, 324.

Tran et al teaches the invention as claimed in claim 49 including a branch history information write control device in an instruction execution processing apparatus comprising :

- (a) a memory unit storing an instruction string (col. 6, line 6),
- (b) a branch prediction unit performing a branch prediction of a branch instruction (220),
- (c) a control unit controlling in such a way that writing of branch history information in the branch prediction unit and control over fetching of the instruction string in the memory unit may not occur simultaneously (col. 10, line 41),
- (d) wherein a fetch request of the instruction string precedes writing of the branch history information (col. 2, line 25; col. 10, line 41), and

further teaches as in claims 50-55, 57-61, 63, 65-72,

- (d) wherein the writing is in timing such that said memory unit cannot accept an instruction fetch request (col. 2, lines 14 and 27; col. 10, line 42; col. 11, lines 1 and 11) – claim 50,
- (e) wherein the writing is in timing for making an instruction pre-fetch request (pre-fetch is not based on fetch PC address and hence can be made while fetch PC address is invalid) – claim 51,
- (f) wherein the writing occurs after several clock cycle from the branch misprediction (col. 10, line 65) – claim 52,
- (g) wherein the writing occurs after a re-instruction fetch request (for correct address; col. 2, line 26) – claims 53 and 57,

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- (h) wherein a temporary instruction buffer (instruction cache) is provided and the writing occurs if the buffer is empty (a cache miss; col. 11, line 1) – claims 54 and 55,
- (i) wherein a write reservation station for temporarily storing the history information is provided (256; col. 10, line 25) and is not replaced until update occurs – claims 58-61, 65, and 66,
- (j) wherein the history information for uncompleted branch instruction is held in the reservation station for immediate second branch instruction (col. 10, lines 44-54) – claim 63,
- (k) wherein the control unit identifies each instruction by an ID (250, col. 10, line 28) – claim 67,
- (l) wherein the history information in the reservation station is nullified upon occurrence of interruption of execution of the branch instruction (nullifying stale data upon interrupt is well known; col. 12, line 34) – claim 68,
- (m) wherein the history information in the reservation station is bypassed to the prediction unit (col. 10, line 43) – claims 69-71,
- (n) wherein dual port for writing and reading is used for holding history information (col. 2, line 4) – claim 72.

The method claims 73-84, 86, 88-94 are equivalently rejected based on the same reason.

10. Applicant's arguments filed April 23, 2004 have been fully considered but they are not persuasive.

Applicant argued that "to delay updating in such a way as not to degrade the function by not receiving a fetch request" implied by "*may not occur simultaneously*" in the presented claim (remark, page 12, line 25) is not as restrictive as - - delay the updating until the fetch request cannot be inherently interfered (line 22) - - implied by "*delaying the updating the current fetch PC register is invalid*" in the prior art reference (Tran, col. 10, line 41).

Examiner is not convinced of any patentable distinction, since in both inferences, the object is not to interfere with fetch request reading by update writing. Furthermore, the claim does not recite the noted inference or other inferences (to be identified in the specification) that seeks to find a distinction, and "delay updating" squarely falls within the scope of "not occur simultaneously" in the context of the recited claim limitations.

In the prior art reference, the updating can occur "while the current fetch PC register is invalid", which means that there is no active fetch request. Hence, the updating not limited to any period after an inhibition of a fetch request but can occur anytime there is no active fetch request. Limiting the update to the period after an "*inhibition of a fetch request*" is a misinterpretation of the prior art by the applicant.

Applicant appears to indicate, in page 12, lines 24 and 25 and page 13, lines 3-6, that the fetch request is not necessarily given the priority over the update, while emphasizing "in a way not to degrade the function", and include the possibility that the updating can occur prior to the fetch request. The updating can occur anytime, including obviously when there is no fetch request yet, i.e., prior to a fetch request. The main objective of the invention is to give priority to the fetch request, when they occur



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simultaneously, since performance degradation occurs when the fetch request is not given the priority.

11. Claims 62, 64, 85, and 87 are allowed over the prior art of record.


12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth S KIM whose telephone number is (703) 305-9693. The examiner can normally be reached on M-F (8:30-17:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Rinehart can be reached on (703) 305-4815. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

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June 15, 2004



KENNETH S. KIM  
PRIMARY EXAMINER